

3. M is the midpoint of CR. If the coordinates of C are (4, 3) and the coordinates of M are (6, -2), find the coordinates of R. Then graph the line.

$$C(\overset{x}{4}, \overset{y}{3}) \quad M(\overset{x}{6}, \overset{y}{-2}) \quad R(x_2, y_2)$$

$$(6, -2) = \left(\frac{4+x_2}{2}, \frac{3+y_2}{2} \right)$$

$$6 = \frac{4+x_2}{2} \quad -2 = \frac{3+y_2}{2}$$

$$12 = 4+x_2 \quad -4 \neq 3+y_2$$

$$8 = x_2 \quad -7 = y_2$$

$$\boxed{R(8, -7)}$$

4. Find the coordinates of the other endpoint of a segment with endpoint N (1, 5), and midpoint M (0, 1). Then graph the line.

$$N(\overset{x}{1}, \overset{y}{5}) \quad M(\overset{x}{0}, \overset{y}{1}) \quad - (x_2, y_2)$$

$$(0, 1) = \left(\frac{1+x_2}{2}, \frac{5+y_2}{2} \right)$$

$$0 = \frac{1+x_2}{2} \quad 1 = \frac{5+y_2}{2}$$

$$0 = 1+x_2 \quad 2 = 5+y_2$$

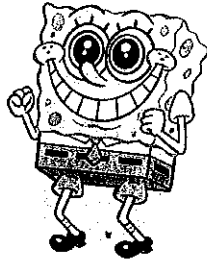
$$-1 = x_2 \quad -3 = y_2$$

$$\boxed{(-1, -3)}$$

Ready for a little challenge?

Spongebob, Patrick, and Squidward have all attempted to solve the problem below, but only one of them is correct! Explain who is correct, and what specific mistake(s) each of the other two have made.

The midpoint of \overline{AB} is M . If A has coordinates $(3, 12)$ and M has coordinates $(-5, 1)$, what are the coordinates of B ?



$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

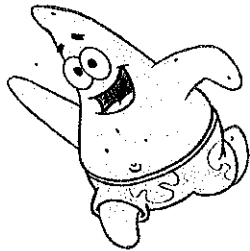
$$(-5, 1) = \left(\frac{3 + x_2}{2}, \frac{12 + y_2}{2} \right)$$

$$(1) -5 = \frac{3 + x_2}{2} \quad (2) 1 = \frac{12 + y_2}{2} \quad (2)$$

$$\begin{array}{r} -10 = 3 + x_2 \\ -3 \quad -3 \\ x_2 = -13 \end{array}$$

$$\begin{array}{r} 2 = 12 + y_2 \\ -12 \quad -12 \\ y_2 = -10 \end{array}$$

$$\begin{array}{l} (3, 12) M(-5, 1) \\ (-5, 1) = \left(\frac{3 + x_2}{2}, \frac{12 + y_2}{2} \right) \\ -5 = \frac{3 + x_2}{2} \quad 1 = \frac{12 + y_2}{2} \\ -10 = 3 + x_2 \quad 2 = 12 + y_2 \\ -13 = x_2 \quad -10 = y_2 \\ (-13, -10) \\ \boxed{(-13, -10)} \checkmark \end{array}$$



$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$= \left(\frac{3 + (-5)}{2}, \frac{12 + 1}{2} \right)$$

$$= \left(\frac{-2}{2}, \frac{13}{2} \right) = \left(-1, 6 \frac{1}{2} \right)$$

*used M as an endpoint



$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$(-5, 1) = \left(\frac{3 + x_2}{2}, \frac{12 + y_2}{2} \right)$$

$$\begin{array}{r} -5 = 3 + x_2 \\ -3 \quad -3 \\ x_2 = -8 \end{array}$$

$$\begin{array}{r} 1 = 12 + y_2 \\ -12 \quad -12 \\ y_2 = -11 \end{array}$$

*didn't multiply by 2

$$\boxed{(-8, -11)}$$